



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/731,678   | 12/06/2000  | Sung-Hee Do          | A0734/7001 (EJR)    | 9300             |
| 7590   | 10/12/2007  |                      | EXAMINER            |                  |
| Edward J. Russavage<br>Wolf, Greenfield & Sacks, P.C.<br>600 Atlantic Avenue<br>Boston, MA 02210 |             |                      | VU, TUAN A          |                  |
|  |             | ART UNIT             | PAPER NUMBER        |                  |
|  |             |                      | 2193                |                  |
|  |             | MAIL DATE            | DELIVERY MODE       |                  |
|  |             | 10/12/2007           | PAPER               |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 09/731,678             | DO ET AL.           |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | Tuan A. Vu             | 2193                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 14 September 2007.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 96-107 and 110-113 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 96-107, 110-113 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application |
|  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

1. This action is responsive to the Applicant's response filed 9/10/07.

As indicated in Applicant's response, no claims have been amended and claims 108-109 canceled. Claims 96-107, 110-113 are pending in the office action.

As per the above response including amendment to the Claims and an adjusted OATH of DECLARATION, and in view of Applicant's explanations regarding Applicant's timeliness or lack thereof in the filing of inventorship change under a 37 CFR § 1.48(b) request, such change request is now given proper weight, and the Office Action will be effectuated based thereupon.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 96-107, 110-113 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al., "Design of Software Systems Based on axiomatic Design", CIRP, 1991, pp. 243-255 (hereinafter Kim), in view of Talbott et al., USPN: 5,375,440 (hereinafter Talbott).

**As per claim 96**, Kim discloses method of designing a software system, comprising:

defining a set of functional requirements (FRs – Fig. 1- pg. 244) that describe what the software system is to achieve;

defining a set of design parameters, where each design parameter in the set satisfies at least one of the functional requirements (e.g. DPs – Fig. 1, pg. 244);

decomposing the set of functional requirements and design parameters to create a hierarchy of functional requirements and a hierarchy of design parameters (Fig. 2, pg. 245; chp: *Hierarchical structuring and decomposition* – pg. 246), wherein at least one functional requirement of the set of functional requirements is a parent functional requirement at a first level in the hierarchy of functional requirements and is decomposed into at least two child functional requirements at a second level in the hierarchy that is below the first level, and wherein the at least two child functional requirements collectively accomplish the parent functional requirement (e.g. FR1 → FR11, FR12 – Fig. 2; *step 1: FRs → DPs*, right column, pg. 246);

defining a design matrix (e.g. *design matrix* – eq. (11), pg. 250; eq. (12), pg. 251) that maps each design parameter in the hierarchy of design parameters to the at least one functional requirement in the hierarchy of functional requirements that the respective design parameter satisfies (*step: 1 → step 6, 7*, pg. 246-248; Fig. 4); and

using the design matrix to define the FR-driven modules the software system (*Hierarchical structuring and decomposition* – pg. 246 – Note: *FR1, FR2 ... FR11, FR12* methods to implement the needs of library software system reads on software object modules; Fig. 7-8, pg. 249; *best software package* - pg. 253, L col. eq. (13)),

wherein at least one functional requirement in the hierarchy of functional requirements represents a software object of the software system, and wherein at least one design parameter in the hierarchy of design parameters represents an input (*step: 1 → step 6, 7*, pg. 246-248; Fig. 10(b) – Note: the DPs as hierarchized and equated with the FRs in order to define a relationship matrix reads on DP being input) to the software object.

But Kim does not explicitly disclose that the FR-driven modules being designed from the matrix object are object-oriented structures. The concept of object-oriented in CASE tool have been considered known when Kim introduced the axiomatic approach (see *Object-oriented Software - Introduction*, L column, pg. 243; CASE – pg. 248; *hierarchy ... divide and conquer* – pg. 252, L col.; Fig 5, pg. 248) in that Kim teaches decomposition of FR into software parent/child modules (e.g. Fig. 5, pg. 248; CASE – pg. 248; *child, parent* - see pg. 249, L column, i.e. suggestive of object hierarchies) and matching of database-stored legacy of DPs or FRs to obtain libraries of software packages or pre-existing modules that satisfy a axiomatic equation, as in a vertical integration process being dependent upon other existing modules organized as top-down layers based on hierarchy of FRs (e.g. pg. 253, L bottom to R column - Note: *database, hierarchy... library ... software package* - pg. 253, R column -- indicative of software package in layers and persisted in package for reusability). Talbott discloses a framework using CASE tool (Fig. 2; col. 10, lines 20-30) to implement a specific industrial application with objects of a domain organized in an inheritance hierarchy (e.g. Talbott: Fig. 6) similar to the modules in Kim (see Kim: Fig. 5, pg. 248). Based on the well-known concept of parent-child hierarchy (e.g. CASE Tools software development using Object-oriented objects – as shown by Talbott) of object-oriented objects and from reusable objects set forth in Kim's independently retrieving existing modules from previously stored hierarchy of the parent/child software modules from above, it would be obvious for one skill in the art at the time the invention was made to implement the modules associated with each FRs as intended by Kim, so that these modules being stored in existing libraries or legacy database be reuse object-oriented packages or modules as exemplified in Talbott (see *reusable ... minimizing cost* – col. 15, lines

24-45), because the creation of OO instances as they are retrieved from reuse can support the non-dependency of module being fetched in Kim's process of integration as purported in the axiomatic matching as set forth above, thus alleviating source code recreating resources usage via reuse of pre-stored objects (see Talbott, col. 15), such that has been widely practiced in CASE Tools as mentioned above.

**As per claim 97**, Kim discloses that at least one element of the design matrix and the at least one design parameter represents an operation performed by the software object ( see *FRx*, *DPx* - equations 7-12, pp. 246-248, 250-251).

**As per claim 98**, Kim discloses that wherein the act of defining the set of define parameters further comprises determining the set of design parameters by mapping the set of functional requirements into a physical implementation domain (e.g. *physical domain* – pg. 251, R column).

**As per claims 99-100**, Kim discloses an act of determining if the design matrix is decoupled (eq. 11, pg. 250); and is not decoupled, manipulating the design matrix into lower triangular form (e.g. pg. 249, L column; eq. 11, pg. 250).

**As per claim 101**, Kim discloses wherein the at least one functional requirement that represents a software object includes at least two functional requirements, and wherein a first of the at least two functional requirements represents a first software object and a second of the at least two functional requirements represents a second software object (e.g. Fig. 2, 4, 5, pg. 245, 247, 248, respectively).

**As per claim 102**, Kim discloses defining a relationship between the first software object and the second software object using a junction (e.g. pg. 249, L column, Fig. 7).

**As per claim 103,** Kim discloses defining a third software object by combining the first software object and the second software object according to a type of the junction (e.g. *Summing Junction* - Fig. 7, pg. 249).

**As per claim 104,** Kim discloses wherein the type of the junction is one of: a summation junction; a control junction', or a feedback junction (e.g. pg. 249, L column; Fig. 7).

**As per claim 105,** Kim discloses one computer readable medium encoded with instructions that, when executed on a computer system, perform a method of allowing a user (e.g. *framework for software design* – pg. 243, R col.) to define a software system, the method comprising allowing the user to:

define a set of functional requirements that describe what the software system is to achieve;

define a set of design parameters, where each design parameter in the set satisfies at least one of the functional requirements;

decompose the set of functional requirements and design parameters to create a hierarchy of functional requirements and a hierarchy of design parameters, wherein at least one functional requirement of the set of functional requirements is a parent functional requirement at a first level in the hierarchy of functional requirements and is capable of being decomposed into at least two child functional requirements at a second level in the hierarchy that is below the first level, and wherein the at least two child functional requirements collectively accomplish the parent functional requirement;

define a design matrix that maps each design parameter in the hierarchy of design parameters to the at least one functional requirement in the hierarchy of functional requirements that the respective design parameter satisfies; and

using the design matrix to define an *object-oriented* structure of the software system (by virtue of obviousness rationale set forth in claim 96), wherein at least one functional requirement in the hierarchy of functional requirements represents a software object of the software system, and wherein at least one design parameter in the hierarchy of design parameters represents an input to the software object;

all of which limitations having been addressed respectively in claim 96.

**As per claims 106-107, and 110-113,** these claims correspond to the subject matter of claims 97-98, and 101-104, respectively; hence are rejected using the rationale set forth therein, correspondingly.

#### ***Response to Arguments***

4. Applicant's arguments filed 9/14/07 have been fully considered but deemed no longer commensurate with the new grounds of rejection. Following are the Examiner's observation in regard thereto.

#### ***Conclusion***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan A Vu whose telephone number is (571) 272-3735. The examiner can normally be reached on 8AM-4:30PM/Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571)272-3756.

Art Unit: 2193

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-3735 (for non-official correspondence - please consult Examiner before using) or 571-273-8300 (for official correspondence) or redirected to customer service at 571-272-3609.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tuan A Vu  
Patent Examiner,  
Art Unit 2193  
October 11, 2007